

WHAT IS CLAIMED IS:

1. An endoscope apparatus comprising:

a scope unit including:

an insertion portion to be inserted in an
5 inspection object space,

an observation unit for observation disposed
in a tip end of the insertion portion, and

a base unit connected to a base end of the
insertion portion; and

10 a fixed unit to which the base unit is detachably
connected,

wherein at least one of a connector on the side of
the base unit and a connector on the side of the fixed
unit in a connector portion disposed in an detachable
15 portion of the base unit and the fixed unit is a
movable connector, and

the detachable portion includes positioning
section for positioning a connected position of the
fixed connector side to the base unit side, when the
20 connector on the fixed connector side is connected to
that on the base unit side.

2. An endoscope apparatus comprising:

a scope unit including:

an insertion portion to be inserted in an
25 inspection object space,

an observation unit for observation disposed
in a tip end of the insertion portion,

a curved portion which bends the tip end of the insertion portion in an arbitrary direction, and

a base unit connected to a base end of the insertion portion; and

5 a fixed unit to which the base unit is detachably connected,

 wherein at least one of a connector on the side of the base unit and a connector on the side of the fixed unit in a connector portion disposed in an detachable
10 portion of the base unit and the fixed unit is a movable connector, and

 the detachable portion includes positioning section for positioning a connected position of the fixed connector side to the base unit side, when the
15 connector on the fixed connector side is connected to that on the base unit side.

3. The endoscope apparatus according to claim 2, wherein the scope unit includes an angle driving section which bends the curved portion.

20 4. The endoscope apparatus according to claim 3, wherein the fixed unit includes a lamp which supplies light to the insertion portion, a power supply unit, a monitor in which a photographed image is displayed, an operation remote controller which operates each
25 constituting portion disposed in the scope unit, and a recording unit which records photographed image data or information on the image data, and

the scope unit includes the insertion portion, an angle control circuit which controls the angle driving section, and a camera control unit which controls the observation unit.

5 5. The endoscope apparatus according to claim 3, wherein the fixed unit includes a lamp which supplies light to the insertion portion, and a power supply unit, and

10 the scope unit includes the insertion portion, an angle control circuit which controls the angle driving section, a camera control unit which controls the observation unit, a monitor in which a photographed image is displayed, an operation remote controller which operates each constituting portion disposed in
15 the scope unit, and a recording unit which records photographed image data or information on the image data.

20 6. The endoscope apparatus according to claim 3, wherein the fixed unit includes a camera control unit which controls the observation unit, and a recording unit which records photographed image data or information on the image data, and

25 the scope unit includes the insertion portion, an angle control circuit which controls the angle driving section, a lamp which supplies light to the insertion portion, a power supply unit, a monitor in which a photographed image is displayed, and an operation

remote controller which operates each constituting portion disposed in the scope unit.

7. The endoscope apparatus according to claim 3, wherein the fixed unit includes a built-in type monitor disposed in the fixed unit, a recording unit which records photographed image data or information on the image data, a power supply unit, and an operation remote controller which operates each constituting portion disposed in the scope unit, and

the scope unit includes the insertion portion, an angle control circuit which controls the angle driving section, a lamp which supplies light to the insertion portion, and a camera control unit which controls the observation unit.

8. The endoscope apparatus according to claim 2, wherein the fixed unit includes a lamp which supplies light to the insertion portion, a power supply unit, and a built-in type monitor disposed in the fixed unit, and

the scope unit includes the insertion portion, an angle control circuit which controls the angle driving section, a camera control unit which controls the observation unit, a recording unit which records photographed image data or information on the image data, and an operation remote controller which operates each constituting portion disposed in the scope unit.

9. The endoscope apparatus according to claim 3,

wherein the fixed unit includes a recording unit which records photographed image data or information on the image data, a power supply unit, a monitor in which a photographed image is displayed, and an operation remote controller which operates each constituting portion disposed in the scope unit, and

the scope unit includes the insertion portion including an illuminating portion constituted of a light emitting diode (LED) in a tip end, an angle control circuit which controls the angle driving section, and a camera control unit which controls the observation unit.

10. The endoscope apparatus according to claim 1, wherein the positioning means includes a convex portion disposed on either one of the base unit and the fixed unit, and a concave portion which is disposed in the other and which is to fit with the convex portion.

11. The endoscope apparatus according to claim 1, wherein the positioning means includes a receiving member including a tapered fitting hole portion in at least either one of the base unit and the fixed unit, and a protrusion which is to fit into the fitting hole portion of the receiving member in the other.

12. The endoscope apparatus according to claim 1, wherein the positioning means includes a rail-shaped convex portion in either one of the base unit and the fixed unit, and a concave portion which is to fit with

the convex portion in the other, and slides to position the units.

13. The endoscope apparatus according to claim 1, wherein the positioning means includes:

5 a first convex portion formed over a connection surface on the base unit side and an upper surface, and a second convex portion formed over the connection surface and a lower surface; and

10 a first concave portion which is formed over the connection surface on the fixed unit side and the upper surface and which can fit with the first convex portion, and a second concave portion which is formed over the connection surface and the lower surface and which can fit with the second convex portion.

15 14. The endoscope apparatus according to claim 1, wherein the positioning means includes:

 a convex portion formed on upper and lower parts in a connection surface on the base unit side; and

20 a concave portion which is formed within the connection surface on the fixed unit side so as to be capable of fitting with the convex portion.

15. The endoscope apparatus according to claim 1, wherein the positioning means includes:

25 a positioning convex surface whose surface including the connector portion is formed to be high by one step within a connection surface on the base unit side; and

a positioning concave surface whose surface including a connector portion connected to the connector portion is formed to be low by one step so as to be capable of fitting with the position convex surface within the connection surface on the fixed unit side.

16. The endoscope apparatus according to claim 1, wherein the positioning means includes:

convex portions formed in L-shapes on four upper/lower left/right corners within a connection surface on the base unit side; and

concave portions formed in the L-shapes so as to be capable of fitting with the convex portions within the connection surface on the fixed unit side.

17. The endoscope apparatus according to claim 1, wherein the positioning means includes:

an annular convex portion disposed around the connector portion within the connection surface on the base unit side; and

an annular concave portion formed around a connector portion connected to the connector portion within the connection surface on the fixed unit side so as to be capable of fitting with the annular convex portion.

18. The endoscope apparatus according to claim 1, wherein the connector portion includes an optical connector portion for optical connection, and a

connector portion for electric connection.

19. The endoscope apparatus according to claim 1, wherein the connector portion includes at least a connector portion for electric connection.

5 20. The endoscope apparatus according to claim 1, wherein the connector portion includes connection detection means for using some of a plurality of connector pins disposed on a connector main body to detect connection of the scope unit.

10 21. The endoscope apparatus according to claim 1, wherein a plurality of different types of scope units are disposed beforehand, and the base unit of any one of the plurality of scope units is selectively and detachably connected to the fixed unit,

15 the base unit includes a first control circuit, and the fixed unit includes a second control circuit, the first control circuit stores scope information for measurement to identify a type and individual piece of the scope unit, and the second control circuit
20 includes scope information read means for reading the scope information.

22. The endoscope apparatus according to claim 1, further comprising:

25 connection holding means for holding a connected state of the base unit to the fixed unit.

23. The endoscope apparatus according to claim 22, wherein the connection holding means includes a lock

member including a shaft extending through the base unit, and a lock hole disposed in a position opposite to the lock member of the fixed unit.

24. The endoscope apparatus according to claim 2,
5 wherein the positioning means includes a convex portion disposed on either one of the base unit and the fixed unit, and a concave portion disposed in the other to fit with the convex portion.

25. The endoscope apparatus according to claim 2,
10 wherein the positioning means includes a receiving member including a tapered fitting hole portion in at least either one of the base unit and the fixed unit, and a protrusion which is to fit into the fitting hole portion of the receiving member in the other.

26. The endoscope apparatus according to claim 2,
15 wherein the positioning means includes a rail-shaped convex portion in either one of the base unit and the fixed unit, and a concave portion which is to fit with the convex portion in the other, and slides to position
20 the units.

27. The endoscope apparatus according to claim 2,
wherein the positioning means includes:

a first convex portion formed over a connection surface on the base unit side and an upper surface, and
25 a second convex portion formed over the connection surface and a lower surface; and

a first concave portion which is formed over the

connection surface on the fixed unit side and the upper surface and which can fit with the first convex portion, and a second concave portion which is formed over the connection surface and the lower surface and which can fit with the second convex portion.

28. The endoscope apparatus according to claim 2, wherein the positioning means includes:

a convex portion formed on upper and lower parts in a connection surface on the base unit side; and
a concave portion which is formed within the connection surface on the fixed unit side so as to be capable of fitting with the convex portion.

29. The endoscope apparatus according to claim 2, wherein the positioning means includes:

a positioning convex surface whose surface including the connector portion is formed to be high by one step within a connection surface on the base unit side; and

a positioning concave surface whose surface including a connector portion connected to the connector portion is formed to be low by one step so as to be capable of fitting with the position convex surface within the connection surface on the fixed unit side.

30. The endoscope apparatus according to claim 2, wherein the positioning means includes:

convex portions formed in L-shapes on four

upper/lower left/right corners within a connection surface on the base unit side; and

5 concave portions formed in the L-shapes so as to be capable of fitting with the convex portions within the connection surface on the fixed unit side.

31. The endoscope apparatus according to claim 2, wherein the positioning means includes:

10 an annular convex portion disposed around the connector portion within the connection surface on the base unit side; and

15 an annular concave portion formed around a connector portion connected to the connector portion within the connection surface on the fixed unit side so as to be capable of fitting with the annular convex portion.

32. The endoscope apparatus according to claim 2, wherein the connector portion includes an optical connector portion for optical connection, and a connector portion for electric connection.

20 33. The endoscope apparatus according to claim 2, wherein the connector portion includes at least a connector portion for electric connection.

25 34. The endoscope apparatus according to claim 2, wherein the connector portion includes connection detection means for using some of a plurality of connector pins disposed on a connector main body to detect connection of the scope unit.

35. The endoscope apparatus according to claim 2,
wherein a plurality of different types of scope units
are disposed beforehand, and the base unit of any one
of the plurality of scope units is selectively and
5 detachably connected to the fixed unit,

the base unit includes a first control circuit,
and the fixed unit includes a second control circuit,

the first control circuit stores scope information
for measurement to identify a type and individual piece
10 of the scope unit, and the second control circuit
includes scope information read means for reading the
scope information.

36. The endoscope apparatus according to claim 2,
further comprising:

15 connection holding means for holding a connected
state of the base unit to the fixed unit.

37. The endoscope apparatus according to claim 36,
wherein the connection holding means includes a lock
member including a shaft extending through the base
20 unit, and a lock hole disposed in a position opposite
to the lock member of the fixed unit.